



June 30, 2014

Casper Field Office, BLM
Attn: Mike Robinson, Planning and Environmental Coordinator
2987 Prospector Drive
Casper, WY 82604

Via email to blm_wy_casper_wymail@blm.gov

Scoping comments on the Converse County 5,000-well project

Dear Mr. Robinson:

The following are the scoping comments of WildEarth Guardians and Prairie Hills Audubon Society on the proposed 5,000-well project in Converse County. As outlined below, we are concerned about the direct and cumulative impacts to wildlife and sensitive habitats, air quality, climate change, public recreation, surface and groundwater quality, and human health resulting from the approval of this 5,000-well project. Please address the issues raised in these comments as you work your way through the NEPA process.

Many of the potentially significant impacts of this project are site-specific in nature as discussed below. For sage grouse, nesting birds of prey, key habitats for BLM Sensitive Species such as black-tailed prairie dogs, and crucial big game winter ranges, the actual locations of wells, roads, overhead powerlines, pipelines, compressor stations, and other facilities approved under this project will determine whether environmental impacts are significant or not, and the magnitude of significant impacts. This is true for impacts to public recreation on the Thunder Basin National Grassland as well. BLM must disclose and fully map actual locations for infrastructure in order to assess the direct and cumulative impacts of this project on sensitive lands and resources. In the past, BLM has pursued a “shell game” approach in some circumstances, giving blanket approval for large numbers of oil and gas wells under an Environmental Impact Statement without assessing site-specific impacts until Applications for Permit to Drill (APDs) are sought, at which time individual APDs are approved under Environmental Assessments (EAs) with Findings of No Significant Impact (FONSI). Under such circumstances, the significant site-specific impacts of locating project facilities in sensitive areas never occurs, in violation of NEPA. BLM must not write a blank check for these 5,000 wells, because the

significance of site-specific impacts to sage grouse habitats and other sensitive lands and resources is now well-understood.

It will be important for BLM to design this project to minimize all of its myriad impacts on the environment, taking into account every possible aspect. We expect BLM to thoroughly analyze, objectively evaluate, and fully disclose all proposed mitigation measures, wildlife protections, and plans, examining a range of different measures under the various alternatives so that the best set of protections can be put in place in the final project.

We also urge the BLM to examine a range of action alternatives to satisfy NEPA's requirements. These should include at least one action alternative under which the project moves forward will full recovery of fluid mineral resources with the lowest possible impact on all aspects of the human environment (including wildlife, air and water quality, human health and safety, and climate change), and at least one action alternative that requires the cessation of activities if and when Clean Air Act violation(s) occur.

BLM must also completely and comprehensively analyze the direct and cumulative impacts on the human environment. In this context, we expect BLM to assess the cumulative impacts of all BLM-permitted (and other) human activities on sensitive resources such as sage grouse habitats or human-induced climate change, including coal mining, livestock grazing, existing vehicle traffic and road networks, existing fences, and existing and reasonably foreseeable patterns of human habitation and subdivision across the project area. BLM must consider and disclose alternatives for getting product produced to market, including potential impacts to the environment for spills, train derailments, and other reasonably foreseeable events. In order to perform this legally required analysis, it will be critical to gather comprehensive baseline information on each and all of these, for both public and private lands.

Impacts to Sensitive Wildlife

Fluid mineral development can have myriad impacts on sensitive wildlife species. These potential impacts include direct loss of habitat, habitat fragmentation, displacement of sensitive wildlife from adjacent habitats not directly affected by surface disturbance, disturbance of wildlife resulting in stress and/or decreased inclusive fitness for wildlife remaining in proximity to development, direct mortality due from multiple activities (including vehicle collisions, bird incineration in burners, poaching mortality), noise impacts, dust pollution resulting in reduced vegetation productivity, and dust and/or hydrocarbon pollution resulting in stress or decreased health and inclusive fitness. BLM should analyze the impacts of each alternative considering each of these factors in the forthcoming EIS.

The project proponents propose that waivers of timing limitations and/or other protections for wildlife become part of the project. We do not support the waiver of timing limitations, which are minimally intrusive for the Operator and the least that BLM can do for wildlife. But we propose a compromise – No Surface Occupancy in and around all sensitive wildlife habitats – including within 5.3 miles of sage grouse leks, within 2 miles of ferruginous hawk nests and within 1 mile of other raptor nest sites, within 0.25 mile of active prairie dog colonies. If this NSO requirement is applied in the form of Conditions of Approval for this project without the possibility of waiver or exception, then waivers of timing limitations can be considered.

Based on WOGCC data, Operators report 1,144 active oil, gas, or coalbed methane wells in the Project Area. Each of these wells is served by an access road, and presumably product pipeline. The forthcoming EIS should analyze the level of development and spatial extent and distribution of these impacts as part of the baseline information analysis, necessary to project cumulative impacts on wildlife. BLM should analyze for each species how much habitat is already in the zone of significant impact for that species today, and how much habitat will be in this zone of impact as a result of the additional impact of this project. For example, sage grouse are significantly impacts on lands within 1.9 miles of main haul roads or wellpads (Holloran 2005), and therefore the habitats within this distance of these features should be flagged as significantly impacted directly and/or cumulatively. For sagebrush obligate passerines, lands within 100 m of roads and also near pipelines for sparrows, significant impacts occur (Ingelfinger 2001).

Sage Grouse

The Project Area encompasses the Douglas Core Area, parts of the Thunder Basin Core Area complex, and additional sage grouse habitats on the Thunder Basin National Grassland that are of such importance to the Forest Service that this agency has proposed to manage them using Core Area prescriptions in order to meet its species viability requirements under NFMA. This project will need to consider the NFMA viability requirements for Forest Service lands and ensure that any alternative that is adopted complies with these requirements. In addition, the greater sage grouse is a BLM Sensitive Species as well as a Candidate Species under the Endangered Species Act. Accordingly, this project must be compatible with maintaining and increasing viable populations of sage grouse, lest it contribute to the need to list the species as threatened or endangered under the Endangered Species Act.

The BLM must apply strong protections to breeding and display areas (leks) the nesting habitats that surround these leks within 5.3 miles (Doherty et al. 2010), early- and late-brood-rearing habitats, and wintering habitats, as each of these habitats is critical to the life cycle of sage grouse and are necessary to ensure its survival and recovery. BLM must map these habitats in detail and apply protections that will ensure that sage grouse use of these habitats remains unimpaired by project facilities and/or activities. We remain unconvinced that the measures proposed by BLM for implementation in the Wyoming Greater Sage-grouse RMP Amendment Draft EIS will prevent significant impacts to sage grouse and their habitats or maintain viable populations of this BLM Sensitive Species over the long term.

Impacts from Infrastructure

Holloran et al. (2007) found that yearling female sage grouse avoided nesting within 930m of oil and gas infrastructure. For each alternative, please disclose how much existing and proposed infrastructure would be within 930m of potential nesting habitat, as defined by Doherty et al. (2010). Your preferred alternative should reduce this acreage with regard to new infrastructure to zero.

Holloran (2005) found that during drilling, wells sited within 3 miles of an active lek had a significant negative impact on the breeding population at the lek. This must be prevented by prohibiting drilling within 3 miles of active leks during the breeding and nesting season, without exception. Holloran (2005) also found that post-drilling, producing wells had a negative impact

when sited within 1.9 miles of leks. BLM needs to disclose how many wells, both existing and proposed in this project, are sited within 1.9 miles of active leks. The agency's preferred alternative should reduce the number of new wells in this radius to zero.

Holloran (2005) found that roads serving 5 or more wells within 1.9 miles of active leks resulted in significant lek population declines, even if the roadway was rendered invisible from the lek due to intervening topography. The same study also documented that greater amounts of traffic resulted in greater impacts to the birds. BLM should examine the acreage of sage grouse habitat currently within 1.9 miles of such roads, including county roads that are equivalent, and the additional acreage that would be this close to major gravel roads under each alternative. The preferred alternative should reduce this new acreage to zero.

Numerous scientific studies (Holloran 2005, Doherty 2008, Walker et al. 2007, Tack 2009, Taylor et al. 2012, and Copeland et al. 2013) have established that one wellpad per square-mile section is the threshold at which significant impacts from excessive well density begin to occur. Please disclose the acreage at which this density is already exceeded by current development, and the extent to which this threshold will be exceeded, both inside Core Areas and in sage grouse habitats outside Core Areas, by the additional wells in this project. The agency's preferred alternative should not allow wellpad density in excess of one per square-mile section in order to prevent impacts to sage grouse and other wildlife.

Knick et al. (2013) found that 99% of active leks in the western half of the species' range were surrounded by habitat with less than 3% surface disturbance per square mile, and in most cases, much less. BLM should disclose which square-mile sections in the project area already exceed the 3% threshold for surface disturbance, which equates to significant negative impacts to sage grouse. The agency's preferred alternative should require that cumulative surface disturbance (existing plus proposed) be kept below the 3% threshold, on a per-square-mile basis.

Overhead powerlines are used by raptors for perching, and are avoided by sage grouse. Nonne et al. (2011) found that raven abundance increased along the Falcon-Gondor powerline corridor in Nevada both during the construction period, and long-term after powerline construction activities had ceased. Braun et al. (2002) reported that 40 leks with a power line within 0.25 mile of the lek site had significantly slower population growth rates than unaffected leks, which was attributed to increased raptor predation. Dinkins (2013) documented sage grouse avoidance of powerlines not just during the nesting period but also during early and late brood-rearing. In the Nevada – Northeastern California Greater Sage-grouse RMP Amendment Draft EIS, BLM documented negative effects to 4 miles from powerlines and beyond. BLM should require all electrical distribution lines to be buried inside and within 0.25 mile of all sage grouse seasonal habitats in order to prevent significant impacts to sage grouse. While Slater and Smith (2010) recorded partial effectiveness of raptor perch inhibitors in the context of large transmission lines (although they were least effective for ravens and golden eagles, the two most significant sage grouse predators), Prather (2010) empirically examined the effectiveness of perch inhibitors on smaller distribution lines and found them completely ineffective. In this EIS, the BLM should analyze and disclose the acreage of sage grouse habitat within 4 miles of existing and proposed powerlines, and the preferred alternative should reduce the acreage newly within 4 miles of grouse seasonal habitats to zero.

Impacts from Noise

Noise can have a major negative impact on sage grouse, causing disturbance and displacement of birds from preferred habitat and drowning out the mating calls of males during the lekking season. Blickley and Patricelli (2012) found that low-frequency noise from oil and gas development can interfere with the audibility of male sage grouse vocalizations:

We found that noise produced by natural gas infrastructure was dominated by low frequencies, with substantial overlap in frequency with Greater Sage-Grouse acoustic displays. Such overlap predicted substantial masking, reducing the active space of detection and discrimination of all vocalization components, and particularly affecting low-frequency and low-amplitude notes. Such masking could increase the difficulty of mate assessment for lekking Greater Sage-Grouse.

These researchers went on to state, “Ultimately, increased difficulty in finding leks or assessing males on the leks may lead to lower female attendance on noisy leks compared with quieter locations. Males may also avoid leks with high levels of noise if they perceive that their vocalizations are masked.” Noise also causes stress to sage grouse. According to Blickley et al. (2012b:1),

We found strong support for an impact of noise playback on stress levels, with 16.7% higher mean FCM [fecal corticoids, an index of stress] levels in samples from noise leks compared with samples from paired control leks. Taken together with results from a previous study finding declines in male lek attendance in response to noise playbacks, these results suggest that chronic noise pollution can cause greater sage-grouse to avoid otherwise suitable habitat, and can cause elevated stress levels in the birds who remain in noisy areas.

They went on to note, “Noise at energy development sites is less seasonal and more widespread and may thus affect birds at all life stages, with a potentially greater impact on stress levels.”

According to Blickley et al. (2010), “The cumulative impacts of noise on individuals can manifest at the population level in various ways that can potentially range from population declines up to regional extinction. If species already threatened or endangered due to habitat loss avoid noisy areas and abandon otherwise suitable habitat because of a particular sensitivity to noise, their status becomes even more critical.”

A newly available scientific study conducted within the Lander Field Office evaluates the impacts of development-related noise on sage grouse (Patricelli et al. 2012). Patricelli also recommends that noise be limited to 10 A-weighted decibels above the ambient noise level, but points out that 39 decibels is not the appropriate ambient noise level for their Lander Field Office study site (and generally), but instead that 20 to 22 decibels is the actual background noise level measured at sage grouse leks. To achieve these levels, these researchers recommend: “Therefore to avoid disruptive activity in areas crucial to mating, nesting and brood-rearing activities, we

recommend that roads should be sited (or traffic should be seasonally limited) within 0.7-0.8 miles from the edge of these areas.” *Id.*

Blickley et al. (2012a) played back recorded continuous and intermittent anthropogenic sounds associated with natural gas drilling and roads at leks. For 3 breeding seasons, they monitored sage grouse abundance at leks with and without noise. Peak male attendance (i.e., abundance) at leks experimentally treated with noise from natural gas drilling and roads decreased 29% and 73%, respectively, relative to paired controls. Decreases in abundance at leks treated with noise occurred in the first year of the study and continued throughout the experiment. Intermittent noise had a greater effect than continuous noise. Female attendance averaged a decrease of 48%; male attendance averaged a decrease of 51%. Road noise leks decreased by 73% versus control leks; drilling noise leks decreased 29% versus control leks. There were residual effects of noise after the treatment ceased. These researchers concluded that sage grouse do not habituate to noise impacts over time.

The Preferred Alternative should require that noise be limited to 30-32 dbA, the absolute threshold recommended by Patricelli et al. (2012). It is notable that in the Upper Green River Valley, the background noise was determined to be 15 dBA (Ambrose and Florian 2014), which would translate to a maximum allowable noise of 25 dBA under the Patricelli et al. (2012) recommendations. This may actually be more reflective of Converse County, which may have less wind (and thus natural background noise) than the Wind River Basin site examined by Patricelli et al. BLM should consider a range of noise restrictions, up to and including a 25 dBA noise restriction within 0.6 mile of the lek (the loafing area for males) in at least one alternative.

Cumulative Impacts

Taylor et al. (2012) concluded that the combined impacts of existing fluid minerals development and West Nile virus would likely result in the functional extirpation of the species with the next West Nile virus outbreak. The approval of an additional 5,000 wells under this project will exacerbate the problem. As a term and condition of project approval, operators should be required to fund and complete the breaching of each and every coalbed methane wastewater detention and/or infiltration reservoir in the Powder River Basin as offsetting mitigation for the project, as a means of neutralizing the compounded threats of fluid mineral development with West Nile virus outbreaks. This is a reasonable alternative mitigation measure, and we expect the BLM to consider it in detail under at least one action alternative.

Livestock grazing can have a significant negative impact on sage grouse, particularly through the removal of adequate grass cover to hide breeding, nesting, and brood-rearing grouse from predators. Connelly et al. (2000) recommended that a residual stubble height of 7 inches be left behind during these crucial seasons to provide hiding cover for grouse. This threshold was subsequently empirically demonstrated to be a key difference between habitats used by sage grouse and those avoided or unoccupied (Hagen et al. 2007, Prather 2010). As part of the baseline information analysis, BLM should survey sage grouse habitats on both public and private lands to determine the extent to which at least 7 inches of residual grass stubble remains

during the breeding, nesting, and brood-rearing seasons. The impacts of livestock grazing would be expected to be cumulative with the impacts of the developments approved under this project.

BLM should consider the potential impacts of climate change of greater sage grouse in the project area (*see, e.g.,* Neilson et al. 2005), and how the approved industrial developments may exacerbate these impacts in a cumulative way and/or whether and how mitigation measures required under various alternatives might ameliorate these impacts and make long-term grouse viability more likely.

Mountain Plovers

Mountain plover nesting habitat is found in the project area. This species is rare and declining in the Powder River Basin, and we expect BLM to map all known plover nesting habitats, and prohibit surface occupancy within 0.5 miles of such habitats, as a Condition of Approval for the project. The Mountain Plover is a BLM Sensitive Species, recently listed under the Endangered Species Act, and BLM must not permit this project in such a way that contributes to the need to re-list this bird.

Birds of Prey

Golden eagles, merlins, red-tailed hawks, burrowing owls, Swainson's hawks, bald eagles, northern harriers, and other raptor species nest and/or roost in the project area. We expect BLM to undertake a spatially explicit analysis by alternative of how much infrastructure is located within one mile of these sensitive habitats, and the preferred alternative should reduce infrastructure located in such areas to zero. Furthermore, to the extent that timing stipulations are relied upon to provide protections for raptor nests and bald eagle roost sites, these stipulations should be rigorously enforced and not subject to waiver or exceptions.

Ferruginous hawks are among the most sensitive of all raptor species, and are prone to nest abandonment if disturbed (Parrish et al. 1994). Nest abandonment, egg mortality, parental neglect, and premature fledging are common results of disturbing ferruginous hawk nests (White and Thurow 1985). Smith and Murphy (1978) noted that increased human access is a primary threat to the viability of ferruginous hawk nest success. For their central Utah study, these researchers found that "in all instances of nesting failure where the cause could definitely be determined, humans were at fault" (p. 87). White and Thurow (1985) found that walking disturbance and vehicle use had the greatest effect on ferruginous hawk nest success, while vehicle use had the greatest flushing distance. Instead of becoming habituated, most hawks in this study increased their flushing distances with repeated disturbance (*ibid.*). In addition, disturbed nests averaged one less offspring fledged per nest when compared to undisturbed control nests. Oakleaf et al. (1996) pointed out that the cumulative effects of oil and gas development may impact large areas of ferruginous hawk habitat. We recommend a 2-mile No Surface Occupancy buffer to be applied as a Condition of Approval around all ferruginous hawk nests.

Black-tailed Prairie Dog

The black-tailed prairie dog is a BLM Sensitive Species and is a keystone species upon which a wide variety of other wildlife (including burrowing owls, swift foxes, golden eagles, ferruginous hawks, and black-footed ferrets) depend for their survival. In addition to directly impacting prairie dogs and their habitats through bulldozing of habitats and vehicle collision mortality, oil and gas fields indirectly increase prairie dog mortality by expanding vehicular access on public (and private) lands for recreational shooting and poisoning. BLM should prevent new significant impacts from this project to prairie dogs from occurring, by placing all lands within 0.25 mile of active colonies under No Surface Occupancy restrictions as a Condition of Approval for this project. Please note that as a part of its direct and cumulative impacts analysis requirements for this project under NEPA, BLM will need to evaluate the magnitude and cumulative impact of non-project activities deleterious to prairie dogs, including recreational shooting and poisoning.

Other Sensitive Species

We are concerned that the proposed project will have a significant negative impact on swift fox, Preble's meadow jumping mouse, sage sparrow, Brewer's sparrow, sage thrasher, chestnut-collared longspur, McCown's longspur, and northern leopard frog. Please undertake a complete evaluation of these species' occurrence within the project area, and adopt measures to reduce impacts of this project to zero for these species and their habitats. The endangered black-footed ferret has a Recovery Area of 50,000 acres designated under the Thunder Basin Grassland Plan; surface occupancy for additional oil and gas development should not be allowed within this area.

Elk

BLM undertook a scientific literature review of the potential impacts of development and roads to the nearby Fortification Creek Elk Herd (BLM 2007). This report concluded that elk avoided using habitat within 1.7 miles of wellsites and within 0.5 miles of roads, and also cited additional studies that further underscored these findings. Sawyer and Nielson (2005) also found that elk avoid roads by 0.5 miles in his Red Desert study area, which is similarly open and lacking in cover to the project area. Importantly, elk also migrate from Laramie Peak out to the Thunder Basin National Grassland, migrating through and potentially using as critical habitat some of the lands in the project area. BLM must spatially identify migration corridors and seasonal ranges used by this herd, disclosing for each alternative how many wellpads and miles of road will be added within key habitats and migration pathways. Under no circumstances should BLM allow development on the surface within 0.5 mile of elk ranges or migration corridors.

Mule Deer

Oil and gas development has been shown to have a negative population-level impact on mule deer (*see, e.g.,* Sawyer et al. 2006). We are concerned that the Wyoming Game and Fish Department has failed to comprehensively map and identify crucial winter ranges, parturition areas, and migration routes for mule deer in this project area, so we call upon BLM to undertake its own mapping of these key mule deer habitats, so that appropriate protections can be applied. Once identified, no surface disturbing activities should be allowed within 0.5 mile of key ranges or migration corridors.

Impacts to Important Recreational Lands

The project area may include parts of the following Forest Service roadless areas: Downs, Cow Creek Butte, Miller Hills, and Red Hills. These are important recreational lands, and industrial incursions should not be permitted within these areas as a part of this project. Industrial development ruins the wild nature of these rare remaining roadless fragments of native High Plains grassland, and their preservation should be a primary goal in the context of this project.

Impacts to Historical, Cultural, and Paleontological Features

Important historical and cultural sites (as well as Native American Traditional Cultural Properties) may occur within the project area. BLM should identify all of these sites, including but not limited to Paleoindian archaeological sites and Expansion Era trails, homesteads, or features, and ensure that these sites and their settings are not degraded by project-related activities. We are also concerned that irreplaceable fossil finds will be destroyed during the course of this project. The project area should be classified using the Probable Fossil Yield classification system, and important archaeological and cultural sites should be disclosed. The locations of these key features are site-specific, so significance of impact cannot be analyzed without detailed disclosure of the locations of all human impacts to be approved under this project. The project should require lands proposed for surface disturbance to be field-cleared by separate experts in both archaeology and paleontology, prior to the onset of surface-disturbing activities. We are concerned that priceless artifacts will be lost forever, and never be cataloged, if BLM leaves compliance up to Operators whose field personnel are untrained in identification and recovery of important artifacts.

The BLM Must Address the Climate Impacts of the Proposed Oil and Gas Drilling and Fracking

In analyzing and assessing the impacts of the proposed oil and gas drilling, the BLM must disclose the total greenhouse gas emissions that will be associated with the project, including both the direct greenhouse gas emissions associated with drilling, fracking, and production (including future workovers and other maintenance activities) and indirect emissions associated with related activities and downstream combustion of the produced oil and gas.

Direct emissions are likely to result from methane emissions from leaking equipment and other venting activities, as well as from carbon dioxide-emitting combustion activities, including drilling rig operation, compressor engine operation, and flaring.

In disclosing methane emissions, the BLM must ensure that it addresses their global warming impacts based on the best available science. To this end, although the U.S. Environmental Protection Agency has identified that methane has a global warming potential that is 25 times greater than carbon dioxide over a 100 year period (i.e. is 25 times more potent as a greenhouse gas) (*see* 78 Fed. Reg. 71904, 71909 (Nov. 29, 2013)), the Intergovernmental Panel on Climate Change (“IPCC”) has assigned methane a global warming potential of 28 over a 100-year period and 84 over a 20-year period. *See* IPCC, *Climate Change 2013: the Science Basis. Working Group I Contribution to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge University Press (2013) at 731, available at <http://climatechange2013.org/>.

We request the BLM assess total carbon impacts associated with methane emissions on both a 20-year and 100-year scale.

Indirect emissions of methane and/or carbon dioxide are likely to result from truck traffic, compressor station operations, refining, and the ultimate combustion of oil and gas downstream of processing and refining facilities.

In assessing the significance of these direct and indirect greenhouse gas emissions, we request the BLM conduct a cost-benefit analysis that gives due consideration to the social cost of carbon estimates that have been released by the federal government. The social cost of carbon is “an estimate of the economic damages associated with a small increase in carbon dioxide (CO₂) emissions, conventionally one metric ton, in a given year.” See U.S. Environmental Protection Agency, “The Social Cost of Carbon,” website available at <http://www.epa.gov/climatechange/EPAactivities/economics/scc.html>. The carbon cost figure “also represents the value of damages avoided for a small reduction (i.e. the benefit of a CO₂ reduction).” *Id.* A social cost of carbon estimate has been used by federal agencies for many years and in 2013, the Interagency Working Group on the Social Cost of Carbon proposed to update social cost of carbon estimates. See Interagency Working Group on the Social Cost of Carbon, United States Government, *Technical Support Document: Technical Update on the Social Cost of Carbon for Regulatory Impact Analysis – Under Executive Order 12866* (May 2013, revised November 2013), attached as Exhibit 1. Their proposal indicates that by 2020, carbon costs could be as high as \$128/ton of carbon dioxide.

The climate impacts associated with the proposed oil and gas drilling and fracking do not appear to be insignificant matters. Based on BLM estimates in other NEPA documents, direct emissions resulting from the drilling of 5,000 wells could be one million metric tons of CO₂ annually.¹ This is the equivalent of the annual emissions from 210,526 passenger vehicles.² Indirect emissions could be as high as 392 million metric tons of CO₂ annually. Indeed, industry estimates that oil wells in the area produce 500 or more barrels of oil daily. See Kays, H., “Wyoming oil production continues to increase,” *Buffalo Bulletin* (Nov. 13, 2013), available at http://www.buffalobulletin.com/news/article_139d34f8-4c78-11e3-97dd-001a4bcf6878.html. The EPA estimates that CO₂ emissions from oil combustion amount to 0.43 metric tons per barrel. See <http://www.epa.gov/cleanenergy/energy-resources/refs.html>. This means that, when all proposed 5,000 wells are producing, indirect CO₂ emissions from oil combustion could be

¹ The BLM has estimated that single oil and gas wells in Wyoming release 0.0002 million metric tons of CO₂ annually. See BLM, Environmental Assessment for Samson Resources Company Scott Field Development Project, WY-060-EA-067 (Sept. 2013) at 60, available at <http://www.blm.gov/pgdata/etc/medialib/blm/wy/information/NEPA/cfodocs/scott-field.Par.42269.File.dat/EAfinal.pdf>. 5,000 wells, as proposed by BLM, would thus produce one million metric tons of CO₂ annually.

² Based on EPA’s greenhouse gas equivalency calculator, <http://www.epa.gov/cleanenergy/energy-resources/calculator.html>.

more than one million metric tons daily, or 392 million metric tons a year. This would be equivalent to the annual CO₂ emissions from 100 coal fired power plants.³

This indicates that potential carbon costs could be enormous, potentially more than \$50 billion annually.

Although social cost of carbon has normally been utilized in the promulgation of federal rules, there is no indication that the social cost of carbon approach to assessing the significance of carbon impacts is not appropriate for project-level decisions. Indeed, a federal judge recently overturned a U.S. Forest Service and BLM approved coal lease modification and exploration plan in Colorado on the basis that the agencies arbitrarily rejected the social cost of carbon approach to addressing climate impacts associated with expanded coal mining. See *High Country Conservation Advocates v. U.S. Forest Service*, Docket no. 1:13-cv-01723-RBJ, slip op. (June 27, 2014), attached as Exhibit 2.

In analyzing and assessing the potentially significant impacts of greenhouse gas emissions and climate change, we request the BLM give thorough consideration to alternatives that reduce or eliminate greenhouse gas emissions. To this end, we request the BLM rigorously explore and objectively evaluate the following alternatives either collectively or individually as part of other action alternatives:

- An alternative that requires carbon-neutral drilling, fracking, and production activities. This alternative would stipulate that drilling could only proceed if the operator eliminates potential carbon emissions or otherwise secures enforceable offsets that ensure no net increase in carbon emissions. Such an alternative could mandate, for example, that Anadarko or other operators in the area reduce carbon emissions from their other operations elsewhere in Wyoming, such as by centralizing compression operations, reducing methane emissions, or eliminating carbon-intensive equipment.
- Require measures to directly mitigate methane emission impacts, including, but not limited to:
 - Centralized Liquid Gathering Systems and Liquid Transport Pipelines
 - Reduced Emission Completions/Recompletions (green completions)
 - Low-Bleed/No-Bleed Pneumatic Devices on all New Wells
 - Dehydrator Emissions Controls
 - Replace High-bleed Pneumatics with Low-Bleed/No-Bleed or Air-Driven Pneumatic Devices on all Existing Wells; and
 - Electric Compression
 - Liquids Unloading (using plunger lifts or other deliquification technologies)
 - Improved Compressor Wet Seal Maintenance/Replacement with Dry Seals
 - Vapor Recovery Units on Storage Vessels
 - Pipeline Best Management Practices; and

³ Based on EPA's greenhouse gas equivalency calculator, <http://www.epa.gov/cleanenergy/energy-resources/calculator.html>.

- Leak Detection and Repair

Many of these mitigation measures are detailed by the BLM in its assessment of BMPs to protect air quality and would have the added benefit of reducing criteria and other toxic air pollutants, in addition to greenhouse gases. *See* BLM, “Air Resource BMPs” (May 9, 2011), available at

http://www.blm.gov/pgdata/etc/medialib/blm/wo/MINERALS_REALTY_AND_RESOURCE_PROTECTION_/bmps.Par.60203.File.dat/WO1_Air%20Resource_BMP_Slide_show%2005-09-2011.pdf.

Furthermore addressing methane emissions is critical for BLM to ensure compliance with waste minimization requirements. Indeed, the Mineral Leasing Act of 1920 (“MLA”) provides that “[a]ll leases of lands containing oil or gas ... shall be subject to the condition that the lessee will, in conducting his explorations and mining operations, use all reasonable precautions to prevent waste of oil or gas developed in the land...” 30 U.S.C. § 225; *see also* 30 U.S.C. § 187 (“Each lease shall contain...a provision...for the prevention of undue waste....” BLM rules further require that “all [oil and gas] operations be conducted in a manner which protects other natural resources and the environmental quality, protects life and property and results in the maximum ultimate recovery of oil and gas with minimum waste and with minimum adverse effect on the ultimate recovery of other mineral resources.” 43 C.F.R. § 3161.2 (emphasis added). The lease owner and or operator is, similarly, charged with “conducting all operations in a manner which ensures the proper handling, measurement, disposition, and site security of leasehold production; which protects other natural resources and environmental quality; which protects life and property; and which results in maximum ultimate economic recovery of oil and gas with minimum waste and with minimum adverse effect on ultimate recovery of other mineral resources.” 43 C.F.R. § 3162.1(a) (emph. added). Waste is defined as “(1) A reduction in the quantity or quality of oil and gas ultimately producible from a reservoir under prudent and proper operations; or (2) avoidable surface loss of oil or gas.” 43 C.F.R. § 3160.0-5. Avoidable losses of oil or gas are currently defined as including venting or flaring without authorization, operator negligence, failure of the operator to take “all reasonable measures to prevent and/or control the loss,” and an operator’s failure to comply with lease terms and regulations, order, notices, and the like. *Id.* Thus, BLM isn’t just authorized to explore and implement methane reduction mitigation measures in analyzing and assessing alternatives, it is mandated by law.

Air Quality Impacts Must be Analyzed and Assessed

The BLM must analyze and assess air quality impacts and take steps to limit air quality impacts in accordance with the Federal Land Policy and Management Act, which requires the agency to, “provide for compliance with applicable pollution control laws, including State and Federal air, water, noise, or other pollution standards[.]” 43 U.S.C. § 1712(c)(8).

We are particularly concerned over the impacts of the proposed oil and gas development to pollutants for which the EPA has established National Ambient Air Quality Standards. These pollutants include ground-level ozone, nitrogen dioxide, particulate matter (both PM₁₀ and PM_{2.5}), sulfur dioxide, and carbon monoxide.

To ensure an effective analysis and assessment of impacts, we request that the BLM at least use modeling to address ozone, nitrogen dioxide, and particulate matter impacts. Dispersion modeling to address nitrogen dioxide impacts, particularly on a one hour basis, has been utilized by the U.S. Forest Service in analyzing and assessing the impacts of oil and gas development, including most recently on the Fishlake National Forest. *See* U.S. Forest Service, “Fishlake National Forest Oil and Gas Leasing Final Environmental Impact Statement, Supplemental Air Quality Modeling Report: 1-hr NO₂ and 1-hr SO₂” (Sept. 2012), attached as Exhibit 3. It is critical that modeling be utilized to ensure that an accurate analysis is completed and that the BLM ensure that future impacts are appropriately disclosed and mitigated.

The need to model ozone impacts is especially critical because the EPA is proposing to lower the level of the NAAQS from 0.075 parts per million over an eight-hour period to between 0.060 and 0.070 parts per million. The EPA’s Clean Air Scientific Advisory Committee in fact reaffirmed that from a scientific standpoint, there is no basis for retaining the current standard of 0.075 parts per million as it is not sufficiently protective of public health. *See* EPA Clean Air Scientific Advisory Committee, “CASAC Review of the EPA’s Second Draft Policy Assessment for the Review of the Ozone National Ambient Air Quality Standards” (June 26, 2014), attached as Exhibit 4. To this end, the BLM cannot simply assess ozone impacts in the context of whether pollution levels will maintain compliance with the current National Ambient Air Quality Standards. Given the public health risks of ozone concentrations as low as 0.060 parts per million, the BLM must assess potentially significant health impacts on the basis of whether ozone levels will be maintained at or below 0.060 parts per million.

Range of Alternatives and Alternative Mitigation Measures

The BLM must consider a full range of reasonable alternatives for the implementation of this project. We expect the agency to consider the requirement of a range of possible protections to ensure that sensitive lands and resources are not needlessly degraded, and to fully examine and disclose the expected effects on development in consideration of the mitigation measures required under each alternative. In the context of this project, Operators propose wellpads with between 1 and 16 wells. Why only 16? On the Pinedale Anticline, operators have already clustered as many as 72 wells on a single pad.

Like the Converse County project, Alaska’s Alpine Field was developed as a largely horizontal play for oil. The Alpine Field was once heralded as the largest onshore oilfield discovered in North America in its decade (Phillips Petroleum 2002), with a subsurface reservoir variously estimated at 40,000 acres (Sutter 1997, Conoco-Phillips 2013) and 25,000 acres (Redman 2002). The Alpine full-field development project was designed to drain the entire field from two well pads with a total of 36 wells (Redman 2002). For this project, “[h]orizontal wells were selected over vertical wells based on higher expected productivity and improved recovery efficiency compared to vertical wells” (Redman 2002). The total surface disturbance from these two well pads and related facilities ultimately totaled only 97 acres (Phillips Petroleum 2002, Conoco-Phillips 2013). Sutter (1997) noted, “We expect that this minimal footprint should reduce our development cost of this field by 30% as compared to other North Slope fields.” The Alpine Field began production in 2000 and averaged 52,820 barrels of oil per day in 2001 (Phillips Petroleum 2002), ultimately increasing to 30 MBD (Conoco-Phillips 2013). Since Phillips

Petroleum could achieve full development of this 40,000-acre mineral deposit from only two wellpads in the year 2000, it is reasonable to expect project proponents to do the same under much less challenging conditions in Wyoming more than 14 years later, and in the process site those few wellpads that are necessary a safe distance away from sensitive lands such as sage grouse Core Areas or nesting habitats surrounding active leks outside designated Core Areas.

In the context of the Normally Pressured Lance project in western Wyoming, EnCana has announced at a Sage Grouse Implementation Team meeting in April that it intends to drill the entire project with a maximum wellpad spacing of 4 pads per square mile outside sage grouse key habitats, and one wellpad per square mile inside Core Areas. In addition, all wellfield equipment will be concentrated at a maximum of 11 sites throughout the project area, meaning that wellpads will contain only well trees, there will be little or no need for regular vehicle traffic to or human activity on wellpads, and wellpads and their access roads could be almost fully reclaimed back to native vegetation, thereby reducing the impacts of vehicle traffic and human activity on wildlife. The fact that EnCana is proposing such an alternative makes such an alternative a *de facto* reasonable one for this project, and the BLM should consider requiring this in at least one alternative.

The BLM has convened a National Technical Team, which has published recommendations (NTT 2011) based on the best available science for managing fluid mineral extraction and its appurtenant infrastructure to reduce impacts to the greater sage grouse. Implementing these recommendations in full as Conditions of Approval for this project is not only reasonable but potentially legally required in light of BLM's Sensitive Species requirements, the requirement that the agency refrain from approvals that result in undue and/or unnecessary impacts to sage grouse or their habitats under FLPMA, and NEPA's scientific integrity requirements. BLM should also consider the findings of Manier et al. (2013). The NTT recommendations represent BLM's expert opinion on what is required to minimize impacts to sage grouse, which are on the threshold of Endangered Species Act listing. BLM should be conscious of the fact that this project (and others like it across the range of the sage grouse) represent additional and continuing threats to the persistence of sage grouse populations, both locally and cumulatively across its range. The agency would therefore be wise to refrain from approving projects such as this one in a manner that is incompatible with maintaining, and indeed recovering to secure population levels, sage grouse populations that inhabit the project area.

BLM should consider at least one alternative that requires the use of closed-loop drilling. This obviates the need for reserve pits, which expand the surface footprint of wellpads unnecessarily, and represent a health and safety hazard for avian and terrestrial wildlife. In addition, Operators report that wellpads will be up to 12 acres in size; it is our understanding that wellpads already approach or exceed 20 acres in size in the Project Area. Please examine and fully disclose your analysis of this discrepancy.

BLM should consider at least one alternative that forbids the venting or flaring of methane or other products. Venting of methane unnecessarily contributes to climate change, as methane is 23 times as potent a greenhouse gas as carbon dioxide, degrades into carbon dioxide over time, and thus makes an immediate and long-term contribution to climate change without any human benefit in the form of energy. Flaring of natural gas results in carbon and other pollution (some

of it a significant health hazard to people and wildlife) while wasting this potential energy resource and denying local, state, and federal entities the mineral royalties to which they would otherwise be entitled. The environmental impacts and energy waste of these two practices are readily preventable through requiring 'green completions,' under which all fossil fuels are captured and recovered, for later use.

It also would be reasonable to apply comprehensive moratoria for project-related vehicle traffic and human activities (except in emergencies) in sensitive wildlife habitat such as sage grouse seasonal habitats, big game crucial winter ranges or migration corridors, and within 2 miles of ferruginous hawk nests or one mile of other raptor nests, during their key season of use for the wildlife species in question. The Bill Barrett Corporation committed to similar measures for their Big Porcupine Coalbed Methane Project on the Thunder Basin National Grassland, adjacent to the current Project Area, therefore demonstrating that such an alternative is reasonable. *See* Exhibit 5. BLM should consider at least one alternative that requires these measures to be applied, without exception, for this project.

Conclusions

We have deep reservations about the approach that appears to be evolving for this project. Failure to disclose wellsite locations and road alignments, as well as other facilities, will make it impossible for BLM to fully evaluate the significant impacts to the human environment that will certainly result from a fluid minerals project of this magnitude.

According to an article from Mother Jones magazine, BLM data indicates that Converse County, Wyoming is one of the trouble-spots where BLM has not been inspecting oil and gas wells.⁴ BLM has no business permitting additional wells in this area until it fully and regularly inspects the wells it has already permitted.

Respectfully yours,

A handwritten signature in dark ink, appearing to read "Erik Molvar", is written over a light gray rectangular background.

Erik Molvar

Signing on behalf of

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⁴ <http://www.motherjones.com/environment/2014/06/uninspected-oil-gas-wells-map>, site last visited 6/30/14.

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